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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/519,796
Filing Date: December 29, 2004
Appellant(s): KOJIMA, HIROSHI

Nicholas A. Brentlinger
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/11/2010 appealing from the Office action mailed 4/9/2009.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

1, 3, 4, 6-8 and 11. Claims 9 and 10 have been previously withdrawn from consideration.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

EP 0 998 182 A2	UEDA et al.	5-2000
JP 62-107039	MIYAKE et al.	5-1987
US 5,158,657	KADOKURA et al.	10-1992

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1, 4, 6-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (EP 0 998 182 A2) in view of Miyake (JP 62-107039).

a. Ueda et al. disclose an electromagnetic shield plate comprising a transparent substrate [0011], a conductive grid [0024] of metal particles [0018] that forms the claimed mesh metal layer. The mesh layer is preferably covered with a metallic layer of copper [0032 and 0033]. The metallic layer structure may comprise multiple layers and the uppermost is preferably blackened to suppress the reflection of visible light. If multiple layers of metal are to be used the uppermost layer is to be blackened to suppress the reflection of visible light [0033]. The blackening process may be performed using a sulfuration or oxidation treatment [0034]. The blackened layer may then be further coated using an electroplating process such as chromate plating to minimize the variation of thickness of the lower blackened metallic layer. This last, chromate-plated thin leveling layer would also necessarily be black because it is located on the exterior of the shield plate and would also need to suppress the reflection of visible light. The chromate plating layer serves as the claimed density-intensifying layer as it is formed by the same process as Appellant and would also serve to prevent the copper particles from coming

off of the metal mesh layer as claimed. The disclosure of Ueda et al. is silent as to the use of a Cu-Co alloy for the blackened, shielding layer.

b. Miyake teaches the use of a Cu-Co alloy for use as an electromagnetic wave shielding material (claim 1) as a replacement for copper (working example).

c. Ueda et al. and Miyake are from the same field of endeavor (i.e. electromagnetic shielding materials).

d. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have replaced the copper layer of Ueda et al. with the alloy composition of Miyake. The skilled artisan would have been motivated by the desire to create an article that has superior corrosion resistance and high conductivity on a metal foil for an electromagnetic shield as set forth in Miyake.

e. Claim 4 is rejected as metallic layer may be formed using electro-deposition and would result in the same structure afforded by the claimed cathodic electro-deposition process. The presence of process limitations on product claims, in which the product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product. *In re Stephens*, 145 USPQ 656. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to Appellant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292.

f. Claim 6 is rejected as the transparent conductive film is formed over the conductive geometric pattern to cover the entire surface of the electromagnetic shield

plate. This film layer serves to shield near-infrared radiation and provide surface resistance [0045]. The relative depth of transparent conductive film and number of layers are result-effective variables affecting the properties of the film [0045]. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the depth of the resin layer, it would have been obvious to one of ordinary skill in the art to optimize this result-effective variable by routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

g. Claims 7 and 8 are rejected as the transparent conductive film may cover the entire surface of the electromagnetic shield plate thereby filling up the openings in the mesh metal layer [0042]. The transparent conductive film may comprise a color tone correcting near-infrared light absorbing agent [0045].

h. The thickness of the metallic layer is preferably 20 microns or less [0033]. Claim 11 is rejected as it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the density-intensifying layer with a thickness from 0.001 to 0.1 micron because the purpose of the layer is to minimize the variation of thickness of the lower blackened metallic layer and its thickness may only be a fraction of its underlying metallic layer to prevent it from further contributing to any overall thickness variation. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (EP 0 998 182 A2) and Miyake (JP 62-107039) as applied to claim 1 above, and further in view of

Kadokura et al. (US 5,158,657). The disclosure of Ueda et al. and Miyake are silent as to the size of the particle for use in the blackened layer.

a. Kadokura teaches the creation of a circuit substrate and process for its production comprising a conductive film layer **3** that is formed via electro-deposition. The conductive film layer is made conductive with a powder comprising Co or Cu with particle sizes preferably ranging from 0.05 to 1 micron (col. 5, lines 46-55).

b. Ueda et al. and Kadokura are from the same field of endeavor (i.e. electromagnetic shielding materials), the purpose disclosed by Kadokura would have been recognized in the pertinent art of Ueda et al.

c. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to have made the blackened layer of Ueda et al. with the particle sizes taught by Kadokura. The skilled artisan would have been motivated to use particles of that specific size because smaller particles would cause secondary agglomeration and larger particles would cause a problem of sedimentation of particles (col. 5, lines 25-31).

(10) Response to Arguments

1. Appellant argues that Ueda fails to disclose an additional layer formed on the blackened layer. Appellant asserts that Ueda specifically discloses the uppermost layer is a black-colored layer. In paragraphs 0033-34 of Ueda, the applied reference discloses a metallic layer that may consist of multiple layers. The reference also states that it is preferably that the outermost metallic layer be black in color to suppress the reflection of visible light. Ueda also discloses the

use of electroplating a very thin leveling layer on top of the preceding metallic layer to minimize any variation in thickness of said metallic layer. As set forth in the applied reference, the purpose of this last layer is to level out the surface of the underlying metallic layer. This underlying layer has a preferable thickness of less than 20 microns, but not less then 0.1 microns, therefore, the leveling layer would in turn be much thinner than said underlying layer as it serves to only smooth out irregularities in the metallic layer's surface. Examiner takes the position that the metallic layer serves as the claimed blackened layer, because the final plated leveling layer serves only to minimize surface irregularities in said metallic layer, not provide a blackened surface to suppress visible light reflection. The plated leveling layer would in turn serve as the claimed density-intensifying layer. This last, chromate-plated thin leveling layer would also necessarily be blackened because it is located on the exterior of the shield plate and would also need to suppress the reflection of visible light, but could not serve as the lone blackened layer as it could not reasonably be thick enough to suppress reflection on its own when its main function is to minimize surface irregularities on the underlying metallic layer.

2. Appellant argues that Miyake does not disclose any layered structure and, thus, does not disclose that a density-intensifying layer is formed on a blackened layer as claimed. Examiner has not relied upon Miyake to provide the claimed structure. Appellant continues by arguing that Miyake does not disclose that its copper alloy can or should be blackened and that the applied reference in fact teaches that the copper alloy has excellent corrosion resistance. Miyake refers to the corrosion resistance of the copper alloy relative to its exposure to environmental conditions (i.e. salt water), not processes listed in Ueda that are designed to blacken cuprous material. Therefore, one of ordinary skill in the art would not confuse the environmental

corrosion resistance with that of the much stronger blackening process of Ueda and recognize that the materials of Miyake would blacken when subject to said blackening process. The motivation to blacken the alloy of Miyake comes from Ueda that discloses a blackened layer suppresses the reflection of visible light [0033]. Examiner has replaced the copper of Ueda with the cuprous alloy of Miyake.

3. Appellant argues that Ueda does not disclose or provide any reason or rationale to have formed a density-intensifying layer on the blackened layer for intensifying black density for the blackened layer, where the density-intensifying layer is a chromated layer formed by chromate treatment. As set forth *supra*, the chromated leveling layer serves as the claimed density-intensifying layer formed on the blackened uppermost metallic layer of Ueda. This layer would also serve to prevent the particles of the underlying metallic layer from coming off from the mesh layer as it serves as a barrier layer to external exposure as well as a leveling agent.

4. Appellant argues that Examiner has misinterpreted Ueda and that the applied reference does not provide any reason or rationale to add a density-intensifying layer on its blackened layer at least because Ueda does not disclose any layers, metallic or otherwise, that are to be added to the electromagnetic shielding sheet after the blackened layer of the metallic layer is formed, because Ueda expressly discloses that the uppermost layer of the multiple layer structure should be the blackened layer. The reference states that it is preferable that the outermost metallic layer be black in color to suppress the reflection of visible light. Ueda also discloses the use of electroplating a very thin leveling layer on top of the preceding metallic layer to minimize any variation in thickness of said metallic layer. As set forth in the applied reference, the purpose of this last layer is to level out the surface of the underlying metallic layer. This underlying layer

has a preferable thickness of less than 20 microns, but not less then 0.1 microns, therefore, the leveling layer would in turn be much thinner than said underlying layer as it serves to only smooth out irregularities in the metallic layer's surface and could be only nanometers in thickness. Examiner takes the position that the uppermost metallic layer serves as the claimed blackened layer, because the final plated leveling layer serves only to minimize surface irregularities in said metallic layer, not provide a blackened surface to suppress visible light reflection. The plated leveling layer would in turn serve as the claimed density-intensifying layer. This last, chromate-plated thin leveling layer would also necessarily be blackened because it is located on the exterior of the shield plate and would also need to suppress the reflection of visible light, but could not serve as the lone blackened layer as it could not reasonably be thick enough in all areas to suppress reflection on its own when its main function is to minimize surface irregularities on the underlying metallic layer.

5. Appellant argues that the chromate plating disclosed in Ueda is to form one of the multiple metallic layers or the blackened layer itself and does not provide a layer that corresponds to the density intensifying layer as claimed. Ueda discloses a variety of plating methods to make the metallic layers and teaches the use of electroplating to form the leveling layer on top of the underlying metallic layer(s) [0034]. Chrome plating is included in the electroplating processes disclosed in Ueda. Therefore, chrome plating may be used to plate the leveling layer of Ueda that corresponds to the claimed density-intensifying layer.

6. Appellant argues that Miyake fails to overcome the deficiencies of Ueda and Examiner has only relied upon Miyake to teach the use of Cu-Co alloy particles. Examiner agrees that he has only relied upon Miyake to teach the use of Cu-Co alloy particles in electromagnetic devices.

7. Appellant argues that Ueda and Miyake would not have rendered obvious the claimed blackened layer formed of Cu-Co alloy because the Office Action applied an erroneous rationale for the alleged combination that ignores the expressly recited features of present claim 1 and the disclosure of the applied references. As set forth *supra*, Ueda provides the structure for the claimed electromagnetic shielding sheet and Miyake provides for the replacement of Cu with the claimed Cu-Co alloy due to inherent properties superior to elemental Cu.

8. Appellant argues that the Office Action erroneously asserts that the Cu layer of Ueda may be replaced with the Cu-Co alloy of Miyake and that this substitution would allegedly result in a blackened layer formed of Cu-Co alloy. Appellant takes the position that the rationale set forth in the Office Action does not take into consideration the functionality of the blackening of Ueda and the Cu-Co alloy of Miyake and jumps to the conclusion that not only will this benefit be realized in the Ueda electromagnetic shield plate, but that the alloy can be blackened via the processes disclosed in Ueda. The alloy of Miyake is for used in electromagnetic shielding in the same manner as the copper layer in Ueda. Miyake establishes that elemental copper loses its shielding effect due to exposure to environmental effects (page 2). In response to this corrosion, Miyake has made an alloy composition comprising Cu-Co that offers superior corrosion resistance to environmental effects, while maintaining its electrical conductivity. The motivation to incorporate alloy in Ueda comes from providing the electromagnetic shield of Ueda with increased environmental protection. The blackening processes of Ueda are extremely effective on, and specifically selected for, the plating processes used to add either the Cu or Cu-Co alloy layer to Ueda. Therefore, one of ordinary skill in the art would conclude that the alloy of Miyake

would be blackened in the same manner as the Cu layer originally provided for in Ueda, while still offering superior environmental protection compared to the article of Ueda.

9. Appellant argues that the alloy of Miyake cannot both be high in conductivity and be blackened because in order for the material to be high in conductivity its reflectivity to light is high and its blackness is low. The blackening of process of Ueda does not cause a change to the entire metal layer of Ueda, rather it serves to blacken the surface to suppress the reflection of visible light. Therefore, the surface may be blackened to suppress the reflection of visible light while the underlying alloy material may still serve as a conductive material.

10. Appellant argues that if one were to replace the copper of Ueda with the alloy of Miyake, one would merely achieve an alloy on a conductive paste. Replacing the copper of Ueda with the alloy Miyake would achieve an alloy on a conductive paste, but the alloy would then be blackened according to Ueda.

11. Appellant argues that the corrosion resistance of the Miyake alloy would prevent it from being blackened by the processes of Ueda and furthermore it would not have been obvious to have blackened the alloy layer of Miyake. The alloy of Miyake is used in electromagnetic shielding in the same manner as the copper layer in Ueda. Miyake establishes that elemental copper loses its shielding effect due to exposure to environmental effects (page 2). In response to this corrosion, Miyake has made an alloy composition comprising Cu-Co that offers superior corrosion resistance to environmental effects, while maintaining its electrical conductivity. The motivation to incorporate alloy in Ueda comes from providing the electromagnetic shield of Ueda with increased environmental protection. The blackening processes of Ueda are extremely effective on, and specifically selected for, the plating processes used to add either the Cu or Cu-

Co alloy layer to Ueda. Therefore, one of ordinary skill in the art would conclude that alloy of Miyake would be blackened in the same manner as the Cu layer originally provided for in Ueda, while still offering superior environmental protection compared to the article of Ueda.

12. Appellant argues that Examiner has improperly relied upon hindsight to provide rationale for one of ordinary skill in the art to have expected that the Cu-Co alloy can or should be blackened. Ueda clearly establishes that the copper metal layer should be blackened. Examiner has replaced the copper layer of Ueda with the alloy of Miyake, which provides increased environmental corrosion resistance, not resistance to the blackening processes of Ueda.

13. Appellant reiterates his arguments that the combination of Ueda and Miyake would not have rendered the invention of claim 1 obvious. Examiner has previously addressed these arguments in detail. Appellant continues on to argue that Kadokura fails to overcome the deficiencies of Ueda and Miyake, and would not have rendered obvious forming a density-intensifying layer on a blackened layer. Examiner has only relied upon Kadokura to teach a particle size for the blackened Cu-Co layer.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Matthew D Matzek/

Examiner, Art Unit 1786

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